R&S®SFE / SFE100 Broadcast Tester / Test Transmitter

Release Notes

Firmware Version 02.80

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The following abbreviations are used throughout this document:
R&S®SFE / SFE100 is abbreviated as R&S SFE / SFE100.

Broadcasting

Release Notes

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1 Information on the Current Version and History

1.1 Version 02.80

- Released: December 2012

New Functionality

- DVB-T2 (R&S SFE-K16): Absolute timestamps for SFN operation supported
- DVB-T2 (R&S SFE-K16): CCM/ACM signaling check implemented
- DVB-T2 (R&S SFE-K16): DVB-T2 specification v1.3.1 (T2-Base) supported
- DVB-T2 (R&S SFE-K16): DVB-T2 specification v1.3.1 annex I (T2-Lite) supported
- DVB-T2 (R&S SFE-K16): Future Extension Frames (FEF) supported
- DVB-T2 (R&S SFE-K16): Integer number of OFDM cells check implemented
- DVB-T2 (R&S SFE-K16): Process delay determination for SFN operation improved
- DVB-T2 (R&S SFE-K16): Script Files for RUN SCPI SCRIPT enhanced
- DVB-C2 (R&S SFE-K17): New menu item "CALC CENTER FREQ"
- DVB-C2 (R&S SFE-K17): Push button solution for setting RF frequency to valid C2 frequency
- DVB-C2 (R&S SFE-K17): Multiple Data Slices and Data Slice Type 1 supported
- DVB-C2 (R&S SFE-K17): Script Files for RUN SCPI SCRIPT available
- DVB-C2 (R&S SFE-K17): All PLPs can be fed with real transport stream
- DVB-C2 (R&S SFE-K17): Bandwidth extension supported
- DVB-C2 (R&S SFE-K17): Multiple Data Slices are supported
- DVB-C2 (R&S SFE-K17): ISSY and NPD feature supported
- DVB-C2 (R&S SFE-K17): Notches are supported
- DVB-T (R&S SFE-K1): Parameter DIGITAL TV: SETTINGS: CONTROL removed
- TsGen (R&S SFE-K20/22): Data rate calculated automatically when loading a T2MI file
- TsGen (R&S SFE-K22): Play out of BTS files for ISDB-Tmm supported
- TRP Player (R&S SFE-K22): Default value of seamless loop parameters set to ON

Fixed Issues

- DVB-T2 (R&S SFE-K16): Malfunction for some Single PLP setups
- Noise signal (R&S SFE-K40) is faulty after switching from DVB-T2 to DAB
- SFE100: In some cases RF CPLD version read error leads to update
- SFE100: TsGen (R&S SFE K20, K22): Preset selects wrong default file (trp vs. gts)
- T-DMB/DAB (R&S SFU-K11): Type of ETI input signal (NI/NA) is not displayed correctly
- TsGen (R&S SFE-K22): ISDB-T streams (R&S SFU-K224): Repetition rate MPEG-2 tables not according to standard
- TsGen (R&S SFE-K22): MediaFLO streams (R&S SFU-K222) not decrypted correctly

Known Issues

- DVB-T2 (R&S SFE-K16): Time interleaving at Single-PLP via T2MI-Interface limited functionality
- DVB-T2 (R&S SFE-K16): Malfunction at 1.7 MHz channel bandwidth, if T2MI interface is used.
- DVB-T2 (R&S SFE-K16): Malfunction for some Single PLP setups, if (time interleaving = off) is used
- DVB-T2 (R&S SFE-K16): TIME_IL_TYPE = 1 via T2MI-Interface with NumPLP = 1 not yet supported
- DVB-C2 (R&S SFE-K17): Short FEC Frame, 4096QAM, CR 5/6 and Data Slice Type 1 combination not working correctly
- DVB-C2 (R&S SFE-K17): Notch width greater than 255 not working correctly

1.2 Version 02.60

- Released: June 2012

New Functionality

- DVB-C2 (R&S SFE-K17): Multi-PLP/Single D-Slice is supported
- Digital IQ (R&S SFE-K80): Info interface is available
- DVB-S2 (R&S SFE-K8): Symbol rate extended to meet NORDIG standard
- MoCA waveforms (R&S SFU-K364) supported
- New software update process established
- Remote: Zeroconf and mDNS to ease the direct network connection is supported
- TsGen: TS libraries LIB-K70, K71, K72 and K73 supported

- Display of Device ID supported

Fixed Issues

- "TX RECALL: OPTION MISSING" is shown after installing new option and switching to new option
- ARB (R&S SFx-K35): After Recall Appl., recovery of ARB clock rate is faulty
- DVB-T2 (R&S SFE-K16): False S2field1 warning fixed
- DVB-T2 (R&S SFE-K16): 'static_flag' and 'static_padding_flag' signaling for T2Version >= 1.2.1 fixed
- EMC Test streams (R&S SFU-K228): Audio isn't seamless
- Fading: After loading of "*.fad" fading profile ARB Clock Freq. is reset.
- Fading: Speed is correct after software startup and recall of fading profiles
- T-DMB/DAB (R&S SFU-K11): Wrong Null symbol in transmission mode 3

Known Issues

- TsGen: MediaFLO streams (R&S SFU-K222) not decrypted correctly

1.3 Version 02.50

- Released: October 2011

New Functionality

- DVB-S (R&S SFE-K2): Additional roll off factor 0.20 for DIRECTV application added
- DVB-T2 (R&S SFE-K16): Additional SCPI scripts available
- DVB-T2 (R&S SFE-K16): MISO/SFN supported
- Audio BC (R&S SFE-K170): FM RDS: 0x0D terminating character missing
- Audio BC (R&S SFE-K170): FM RDS: Editor accept extended keyboard entries
- DMB Streams France (R&S SFU-K229) supported
- DTV interferers (R&S SFU-K354): DVB-T2 7MHz interferer signal added
- ISDB-Tmm waveforms (R&S SFU-K365) supported

Fixed Issues

- ATV, NICAM ENCODER: Different group delay between external AF inputs.
- DVB-T (R&S SFE-K1): Signal without echoes
- ISDB-T (R&S SFE-K6): Correct PCR restamping with TS PLAYER data stream

- DVB-T2 (R&S SFE-K16): T2MI=ON: Channel Bandwidth = 6, 7 MHz is not working correctly
- Audio BC (R&S SFE-K170): Preemphasis calculation of frequency below 1kHz is missing

Known Issues

- DVB-T2 (R&S SFE-K16): SinglePLP with TIME_IL_TYPE = 1 via T2MI-Interface not yet supported d

1.4 Version 02.40

- Released: July 2011

New Functionality

- ARB (R&S SFE-K35): Reload algorithm dependent on filename, date/time and size
- ARB (R&S SFE-K35): 1GSa memory is supported
- R&S SFE-K38: Multichannel ARB waveforms are supported
- CMMB (R&S SFE-K15): PMS TS Stuffing allowed
- DVB-T2 (R&S SFE-K16): MPLP is supported
- DVB-T2 (R&S SFE-K16): SCPI scripts for DTG, NORDIG, OFCOM and V&V setups
- ISDB-S waveforms (R&S SFU-K362) are supported
- Satellite interferers (SFU-K363) are supported
- MediaFLO (R&S SFE-K10): AIS 2.0 is supported
- R&S SFU-K227 T2MI stream library supports content streams
- TsGen: Performance optimized when decrypting non gts based transport streams
- SFE100: Reset in progress is indicated

Fixed Issues

- DVB-T2 (R&S SFU-K16): Single-PLP parameters not settable, if R&S SFU-K20 or R&S SFU-K22 is not available
- FADING: Recall of unchanged predefined fading profiles shows Standard USER
- Local Vector Modulation Adjustment is not possible for frequencies <= 87 MHz
- Recall of instrument settings may corrupt GUI menus
- SFE100: Multiple start of recovery destroys HD image
- TsGen: Naming of missing software options is unclear
- TsGen: Seamless TRP may cause assertions

- Digital In: Measurement of low-level input signals not correct
- SFE100: High power option (R&S SFE-B90): Level linearity is not ensured
- Audio BC: Sporadic remote timeouts occur after switching signal source
- ISDB-T: Default value of AC Data corrected (now ALL1)
- Remote: Command error at READ:IQC:TDMB:PROT:PROF and LEV

Known Issues

- SFE: DVB-T2 (R&S SFE-K16): The fading function is not supported with this firmware version
- DVB-T2 (R&S SFE-K16): Maximum number of PLP is limited to 6
- DVB-T2 with T2MI=ON: Channel Bandwidth = 6, 7 MHz is not working correctly

1.5 Version 02.32

- Released: October 2010

Fixed Issues

- DVB-T2: SFE: Fading is not supported
- SFE100: ARB works not with K35
- Level is not correct after RECALL APPL
- CMMB: Long remote control response time when missing input signal
- Fading: Uncertainty of 10ns in delay and 0.1° in phase due to rounding issues.

1.6 Version 02.30

- Released: October 2010

New Functionality

- DVB-T2 (SFE/SFE100-K16): SPLP is supported
- Satellite Interferers (SFU-K363) is supported
- T2-MI Streams (SFU-K227) is supported
- EMC Test Streams (SFU-K228) is supported
- TsGen: Support of ETI files with extension .xeti

Modified Functionality

- TsGen: K22: Sample TRP streams are included

- Remote: VXI11 protocol works immediately after booting
- CMMB: Default values changed

Fixed Issues

- Fading: Doppler shift is not correctly calculated
- ATV, AudioBC: Different group delay between external AF inputs

Known Issues

- SFE: DVB-T2: The fading function is supported with the next version 02.32

1.7 Version 02.22

- Released: June 2010

Fixed Issues

- Favorites: Indicated menu path of parameters is not correct
- CMMB: SFE Fading not supported, SFE100 Noise not supported

1.8 Version 02.20

- Released: April 2010

New Functionality

- Fading (SFE-K30) is supported
- SFE100: NOISE: Narrow-band AWGN generator option is supported
- FILE: Run SCPI script is supported

Fixed Issues

- T-DMB/DAB: After switching the parameter transmission mode, sometimes the data structure is invalid
- ARB: Generator has problems with deleted waveform files
- Remote: GUI is not correct updated after SYST:KLOCK ON
- Remote: *TST? answers reverse

Known Issues

- SFE: CMMB: The fading function is supported with the next version 02.22.
- SFE100: CMMB: The narrow-band AWGN is supported with the next version 02.22.

1.9 Version 02.00

- Released: January 2010

New Functionality

- SFE100: Multi standard functionality is supported
- ATV B/G: Group delay precorrection for B/G Australia is available

Modified Functionality

- ATV: No warning displayed when changing residual carrier
- ATV VIDEO BASIC: Version 02.10 supports uniform test line assignment

Fixed Issues

- BER: Inversion of serial data input affects BER TS input
- CMMB: Output level too low in 2MHz mode
- T-DMB / DAB: Spectrum has half bandwidth
- DVB-T rare issue: Signal corrupt after changing transmission standard
- TsGen has wrong data rate in bin mode after RECALL
- Application error when terminating the application

Known Issues

- T-DMB/DAB: After switching the parameter transmission mode, sometimes the data structure is invalid. A receiver can synchronize to the frame structure but cannot detect the stream content. In this case, switch the transmission mode again.

1.10 Version 01.50

- Released: September 2009

New Functionality

- ATSC M/H (SFx-K18) is supported
- SFE100 Var.12 is supported
- DRM+ WAVEFORMS (SFU-K361) are supported

Modified Functionality

- BERT: New feature log file
- FM: RDS: Group type 3A and 8A is used for TMC only

- FM: RDS: Radio Text and TMC without the corresponding group type in GROUP SEQUENCE is set to busy permanently
- ISDB-T: Provide warning when measured data rate higher than max useful data rate
- Remote: ARB: Query command for maximum number of samples available
- Softkey for adjustment of vector modulation local is available

Fixed Issues

- ATV - Malfunction of video amplitude measurement
- CMMB: Test signal: Generated PRBS is according standard
- CMMB: MF-stream can't be analyzed when Urgent Broadcast Table is present
- Info manager shows multiple punctuation marks as separator
- Info manager shows wrong warning
- Malfunction of input interface at MPEG-TS of type SYNC/187PAYLOAD
- T-DMB/DAB incorrect information about MID
- TsGen: Recall of a play file with data rate lower than the actual minimum data rate is not correct.

Known Issues

-

1.11 Version 01.40

- Released: May 2009

For instruments delivered after May 2009 the upper frequency limit is extended to 2.7 GHz without any restrictions on level accuracy.

With instruments delivered earlier, the upper frequency limit is also extended to 2.7 GHz, but in the range from 2.5 GHz to 2.7 GHz, the level inaccuracy may be increased.
In this case 'FREQUENCY OVERRANGE' is indicated.

New Functionality

- RF: Frequency range is extended to 2.7 GHz
- CMMB (SFE/SFE100-K15) supported
- CMMB: Input Signal - Source Test Signal is supported
- CMMB stream library (SFU-K225) is supported
- CMMB waveforms (SFU-K358) are supported
- ATV-Multi (SFE100-K195) is supported

- DVB-T2 waveforms (SFU-K359) are supported
- TsGen: Seamless TRP is available
- FILE: Save now function available at SFE100 local GUI
- ARB and TsGen: Instrument setup via config file is supported
- OCXO Upgrade (SFE-U3) is supported

Modified Functionality

- Audio BC: FM: Fully support of RDS functions
- ATV: Audio frequency sweep in video generator supported
- DVB-S2 Symbolrate up to 45 MSymb/s (overrange)
- ISDB-T: Coder supports test packets with payload "00" and "FF"
- ISDB-T: TMCC "next" parameters are configurable
- ISDB-T (1/3 SEG): Residual spectrum at offset +/- IFFT sampling frequency (8.126 MHz) eliminated
- K22: File name extension *.eti for ETI streams supported
- ARB: 2 GByte SODIMM supported
- T-DMB/DAB: TII signalling according to standard
- T-DMB/DAB: ZERO payload is supported
- Test packets with payload = 00/FF supported
- ARB memory management is optimized
- Settling time for RF = ON is fast and constant

Fixed Issues

- RF: Sporadic signal loss solved
- Communications displays wrong IP address
- ISDB-T Residual Carrier Shift does not have an impact on DVB-T center frequency
- ISDB-T: clean constellation diagram
- Beta: ISDB-TSB: Time interleaving index I = 32 is available
- ATV remote commands without [SPECial] works correct.
- ATV values are stored after changing the modulation signal source
- BER measurement with inverted clock works correctly
- DVB-S2 corrupt TS at some transmission parameters
- Valid DVB-S2 signal after change of code rate
- J83/B: Interleaver mode switching works correct
- T-DMB/DAB padding complies with standard

- TsGen is not showing BB: NO FPGA REGISTER!
- TsGen is working with packet size of 204
- TsGen: Selected filenames in Info area and open file area are the same
- Remote: *TST? works correct.
- Remote: FREQ:CHAN:TABL:FREQ[?] works correct
- "End program" with progress bar is not shown during shutdown
- Application does not crash when pressing FILE button in channel table
- RDS-Coder Radiotext: Sending of two equal ratio text one after another will cause the busy sign permanently
- FREQ. DEV. AUDIO indicates calculated deviation of FREQ. LEFT or FREQ. RIGHT in spite of setting SOURCE LEFT or SOURCE RIGHT ist set to OFF

Known Issues

- BER: Test Transport Stream SYNC 187 PAYLOAD with FF(Hex) Payload cannot be decoded correctly at TS1/TS2 input.
- TSGEN: For units equipped with GTS Player option (SFE/SFE100-K20), a Recall following a Preset may not set the TS-Datarate correctly.

1.12 Version 01.32

- Released: October 2008

New Functionality

- AM/FM RDS Coder (R&S SFE/SFE100-K170): Basic RDS FM functional.
- DIRECTV Legacy Modulation Coder (R&S SFE/SFE100-K9) supported.
- HD Radio™ Waveforms (R&S SFU-K357) supported.
- TV channel tables installed ex factory.
- R&S SFU channel table files can be used in R&S SFE/SFE100 and vice versa.

Modified Functionality

- R&S SFE: No limitation regarding number of standards.
- Remote control: 'UNIT:VOLTage' is compliant to R&S SFU.

Fixed Issues

- BER Measurement (R&S SFE-K60) fully functional.
- ARB Waveform Generator (R&S SFE/SFE100-K35) play beyond 128MS works correctly.
- ATV: LOAD ATV VIDEO LIB: Long file paths do not exceed their text box.

- SAVE / RECALL APPL with ATV/AUDIO BC file works correctly.
- ISDB-T/ISDB-T_B /ISDB-T_{SB} Coder (R&S SFE/SFE100-K6): SEGMENTS (A) and (B) are shown correctly after switching SYSTEM from ISDB-T_{SB} to ISDB-T.

Known Issues

- J.83/B Coder (R&S SFE/SFE100-K5), 1024QAM: Switching interleaver modes may cause loss of output signal. Workaround: Toggle symbol rate or constellation.

1.13 Version 01.30

- Released: September 2008

New Functionality

- DVB-S/DVB-DSNG Coder (R&S SFE/SFE100-K8): DVB-S2 supported.
- J.83/B Coder (R&S SFE/SFE100-K5) supported.
- MediaFLO™ Coder (R&S SFE/SFE100-K10) supported.
- AM/FM RDS Coder (R&S SFE/SFE100-K170): AM/FM supported.
- BER Measurement (R&S SFE-K60) supported.
- ARB Waveform Generator (R&S SFE/SFE100-K35): Memory (1GByte) for 256 MSamples is supported.
- Remote control: RAW TCP/IP is supported.
- TS Generator (R&S SFE/SFE100-K20), remote control: Read position is readable.
- TX: Digital IQ IN indicates input symbol rate.
- R&S WinIQSIMTM Support (R&S SFE-K350) and CUSTOM OFDM (ARB) (R&S SMU-K15) supported.
- DAB+ Streams: (R&S SFU-K223) supported.
- ISDB-T Streams: (R&S SFU-K224) supported.
- File selector: Recent list available.

Modified Functionality

- RF:
  - Level range extended.
  - Sideband suppression is improved.
- DVB-S/DVB-DSNG Coder (R&S SFE/SFE100-K3): Lower limit of symbol rate in DVB-S extended.
- TS Generator (R&S SFE/SFE100-K20):
  - File type filter is improved.

  - No more sporadic refuses to play out a file.
- Dynamic warnings of any application are visible in all applications.

Fixed Issues

- TS Generator (R&S SFE/SFE100-K20): After preset, R&S SFE with TRP Player (R&S SFE-K22) and without TS Generator (R&S SFE-K20) does not report warning: gts file option missing.
- DVB-T/H Coder (R&S SFE/SFE100-K1): No longer incorrect TS messages in DVB-T.
- Focus loss pressing <0> and <ESC> solved.
- Long file paths do not exceed their text boxes.
- Type libraries / DLLs can be loaded after software update V01.20.

Known Issues

- BER Measurement (R&S SFE-K60): PRBS measurement limited to continuous clock and ENABLE=always. Due to polling short interrupts may not be detected. Not supported with T-DMB (T-DMB/DAB Coder, R&S SFE/SFE100-K11).
- AM/FM RDS Coder (R&S SFE/SFE100-K170): FM RDS not fully functional.

1.14 Version 01.20

- Released: June 2008

New Functionality

- DVB-C / ISDB-C (R&S SFE/SFE100-K2) supported.
- DVB-S/DVB-DSNG Coder (R&S SFE/SFE100-K3): DVB-S supported.
- ATSC/ 8VSB Coder (R&S SFE/SFE100-K4): 8VSB supported.
- ATV: Automatic VIDEO gain is supported.
- ATV Video (R&S ATV Video): Additional signals.
- ISDB-T/ISDB-T_B /ISDB-T_{SB} Coder (R&S SFE/SFE100-K6): Test signal "sync + 187 payload" supported.
- R&S SFE100:
  - Setup: Hardware and software information is displayed.
  - 1PPS used for TRIGGER IN.

Modified Functionality

- TS Generator (R&S SFE/SFE100-K20): After preset, TS Generator is in running state.

- ARB Waveform Generator (R&S SFE/SFE100-K35): ARB file is checked for valid software option before loading.
- ISDB-T/ISDB-T_B /ISDB-T_{SB} Coder (R&S SFE/SFE100-K6): Improved MER of central carrier.
- Setup Communications:
  - After editing is finished, menu data are updated again.
  - Full computer name is not editable.

Fixed Issues

- Digital IN: PEP value is refreshed with pressing REFRESH under SIGNAL INFO/STAT.
- ARB Waveform Generator (R&S SFE/SFE100-K35):
  - Preset value of clock frequency harmonized with preset file.
  - Memory size is indicated correctly.
- ATV Video (R&S ATV Video):
  - Field jitter of NTSC works correctly.
  - Frequency response of SINx/x is repaired.
  - Color burst position and length of PAL, NTSC are correct.
  - Color burst length and field jitter are correct.
- ISDB-T/ISDB-T_B /ISDB-T_{SB} Coder (R&S SFE/SFE100-K6):
  - Time interleaver fully functional.
  - Remote control: ACD2 works correctly.
- Remote control: Commands for signal info / statistics supported.
- TS Generator (R&S SFE/SFE100-K20) works correctly after changing DTV standard.
- Video Generator (R&S SFE/SFE100-K23):
  - Option is shown in active software options.
  - Memory size for video generator is indicated correctly.
- "Attach to card reader failed" during startup will not appear any longer.
- 108 Mbit/s limit of ASI interface removed.
- After (repeated) preset and pressing the rotary knob (as enter), the softkeys are working again.
- During file load, menu and progress bar are visible.
- Recall of APPL does not result in a deadlock.
- Signal info / statistics: Refresh only visible with DIGITAL IN selected.
- With RF lower than 87 MHz, local adjustment works correctly.

1.15 Version 01.10

- Released: February 2008
- DTMB functionality according standard (8 MHz) guaranteed only.

New Functionality

- ISDB-T/ISDB-T_B /ISDB-T_{SB} Coder (R&S SFE/SFE100-K6) supported.
- DTMB/DMB-TH Coder (R&S SFE/SFE100-K12): DTMB supported.
- TRP Player (R&S SFE/SFE100-K22) supported.
- TS Generator (R&S SFE/SFE100-K20):
  - Supported
  - New PCIe interface (01.02.00.04).
- ATV Standard B/G, D/K, M/N, L Coder (R&S SFE/SFE100-K190/K191/K193/K194) and ATV Multistandard (R&S SFE-K195) supported.
- Extended I/Q Input (R&S SFE/SFE100-K80): Dig. I/Q IN supported.
- ARB Waveform Generator (R&S SFE/SFE100-K35):
  - File name and clock frequency displayed in TX application.
  - Cable Interferers (R&S SFU-K356) supported.
- DVB-T/H Coder (R&S SFE/SFE100-K1): Stuffing OFF supported.

Modified Functionality

- Remote Control: Subsystem Identifier "IQCoder:" is optional.
- Trigger Output available with REFERENCE EXT enabled.

Fixed Issues

- Diagnostic of points with negative voltage works correctly.
- Error Message "MISSING SW OPTION" added.
- Frequency setting at multiples of 120 MHz is correct.
- T-DMB/DAB Coder (R&S SFE/SFE100-K11): STC/SSTC table handled correctly with missing ETI signal at start-up in T-DMB.
- Vector modulation adjustment is working with RF OFF.

Known Issues

- DVB-T/H Coder (R&S SFE/SFE100-K1): TS Generator (R&S SFE/SFE100-K20) with 5 MHz bandwidth not working in DVB-T.
- ISDB-T/ISDB-T_B /ISDB-T_{SB} Coder (R&S SFE/SFE100-K6): When switching from other Transmission-Standards to ISDB-T: Time interleaver with I=0 working only; when booting with ISDB-T: Time interleaver fully functional.

- ARB Waveform Generator (R&S SFE/SFE100-K35): Short spurious signals when switching RF, level or clock rate in sporadic cases.

1.16 Older Releases

VERSION 01.04 / 2007-12-17 / Manual E2

Note: For SFE100 demo units only
Known problems: DVB-T hierarchical coding: Some combinations with external TS not working properly

- DTMB (K12) supported
- ATV (K190, K191, K193, K194) supported
- High Power SFE100-B90 supported

VERSION 01.02 / 2007-09-28 / Manual E1

Note: -
Known problems: None

- T-DMB (K11) supported
- ARB (K35) supported

VERSION 01.00 / 2007-08-31 / Manual E1

Note: FW for demo units only
- Known problems: None

- DVB-T/H (K1) supported
- AWGN (K40) supported / SFE only

2 Modifications to the Documentation

In case of T2MI stream files the datarate of a T2MI file is determined automatically, if
- the datarate is not part of the TRP file header information and
- PCR information is not available and
- the T2MI TRP file is not encrypted (which means not of type .T2MI_C) and
- the TRP file has the file extension .T2MI.

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3 Firmware Update

Your instrument is delivered with the latest firmware version available. Firmware updates are provided on the Rohde & Schwarz Home Page (http://www.rohde-schwarz.com/downloads/firmware/sfe.html), by Rohde & Schwarz service centers or sales offices.

You can install the new firmware version by using either the USB or the LAN interface:

- For an update using the USB interface, store the downloaded update files on a memory stick.
- For an update using the LAN interface (due to speed recommended), store the downloaded update files on a network directory.

Further information

- Installing software options
  See User Manual, chapter "Basic Instrument Configurations".
- Connecting the instrument to a network (LAN)
  See the User Manual, chapter "Operating the R&S SFE / SFE100 in a LAN".
- Sharing and accessing instrument drives
  See the User Manual, chapter "Operating the R&S SFE / SFE100 in a LAN".
- R&S SFE only: Making a backup before installing new firmware
  See the User Manual, chapter "Installed Software".

3.1 Update Information

The firmware update consists of the following files. The version numbers in the file names vary with each update (symbolized by placeholder x).

- Firmware: *Sfe_xx.xx.xx.xx(Release).exe*

If Analog Realtime Modulations (ATV) are used, the following file is necessary too:

- Video signals: *AtvVideoBasic_xx.xx.xx.xx.msi*

The update is performed under control of the Windows XP Embedded operating system. Windows XP can only be accessed if a mouse and optional an external keyboard is connected.

3.2 Updating the Firmware

The updating process consists of 2 steps:

1. Preparing the instrument for the installation.
   R&S SFE: see Preparing the R&S SFE for the Installation on page 20
   R&S SFE100: see Preparing the R&S SFE100 for the Installation on page 20
2. Installing the new firmware version. The procedure is the same for R&S SFE and R&S SFE100.
   See Installing the New Firmware Version on page 21

3.2.1 Preparing the R&S SFE for the Installation

1. Switch off the R&S SFE.
2. Connect mouse and/or external keyboard to the USB interface.
3. Switch on the R&S SFE.
4. Wait until the R&S SFE firmware has booted and the application has started.
5. Access the Windows XP Embedded desktop.
   - Operation with mouse: Click the "Close" button of the R&S SFE application.
   - Operation with keyboard: Press ALT+F4 to close the application.

   The Windows XP Embedded desktop is displayed.
6. Copy the update files.
   - Using the Windows Explorer, open the folder with the update files.
   - Delete all files in *D:\SFE\Installations*.
   - Copy the update files to *D:\SFE\Installations*.

Proceed with the installation as described on page 21.

3.2.2 Preparing the R&S SFE100 for the Installation

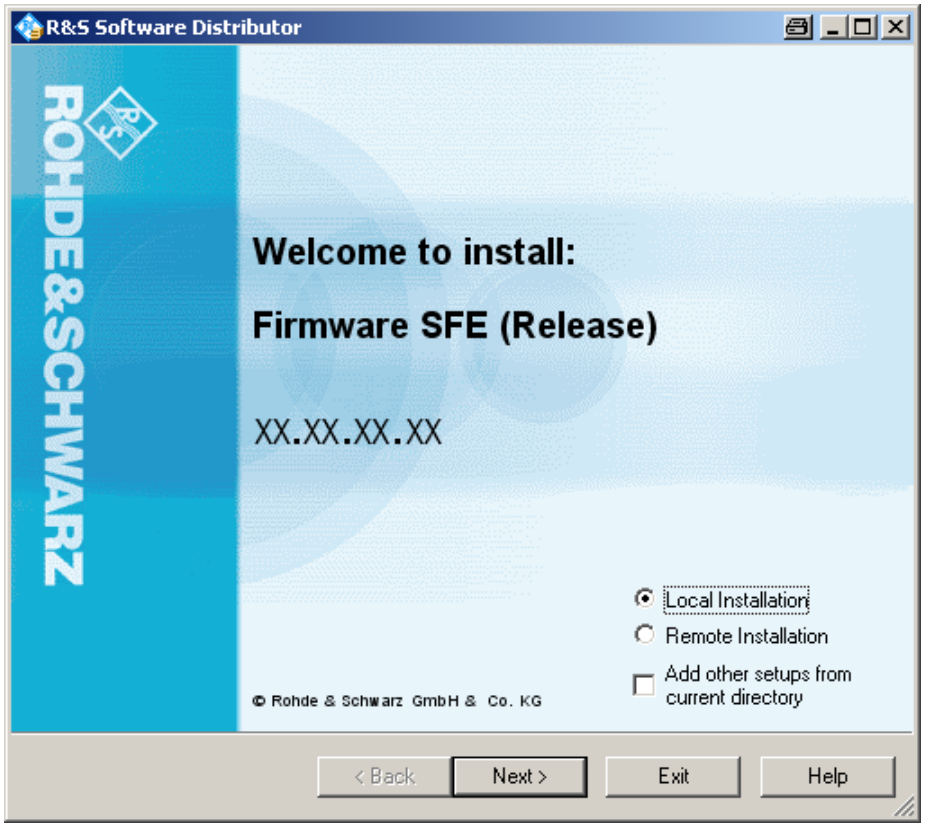
1. Switch on the R&S SFE100.
2. Wait until the R&S SFE100 firmware has booted and the application has started.
3. Using Remote Desktop or VNC, start remote operation of the R&S SFE100.
4. Click the "Close" button of the R&S SFE100 application to access the Windows XP Embedded desktop.

   The Windows XP Embedded desktop is displayed.

5. Copy the update files.
   - Using the Windows Explorer, open the folder with the update files.
   - Delete all files in *D:\SFE100\Installations*.
   - Copy the update files to *D:\SFE100\Installations*.

3.2.3 Installing the New Firmware Version

1. Execute *Sfe_xx.xx.xx.xx(Release).exe*.
   The R&S Software Distributor is displayed.

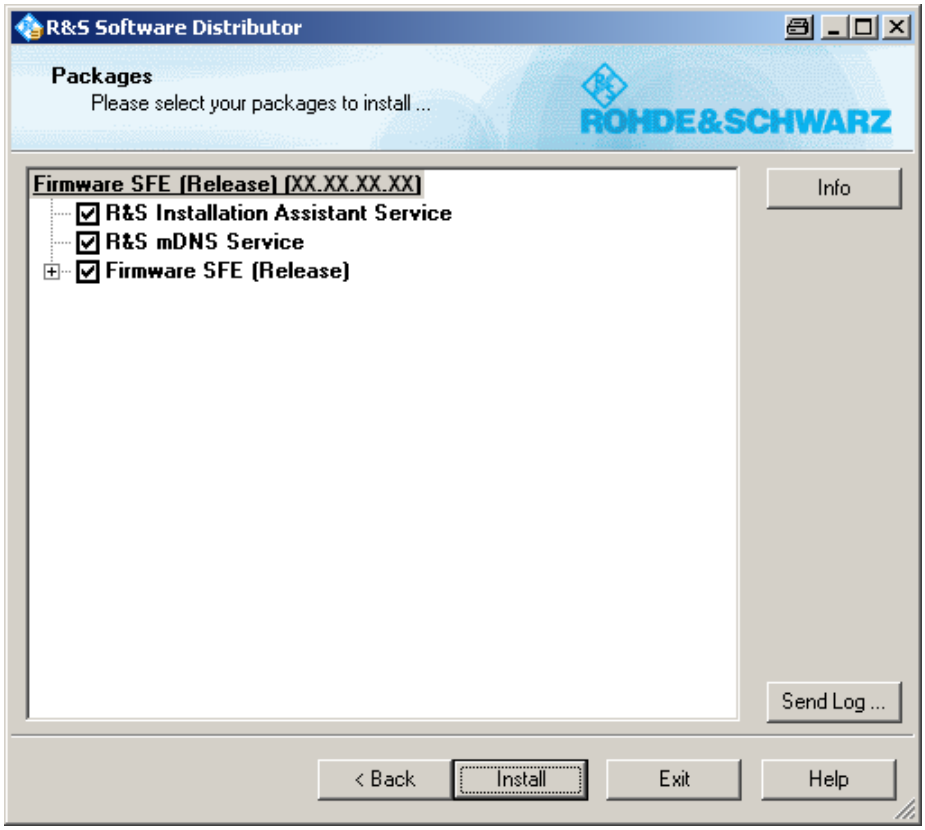


2. Select the installation type:

   "Local Installation": If you start your setup file from the R&S SFE hard disk or an external storage medium (USB memory stick, CD-ROM with external drive) connected to the R&S SFE.

   "Remote Installation": If your setup files are on an external host computer that is connected to your R&S SFE.
   Note: A remote installation allows you to update R&S SFEs simultaneously. To use this feature, the previously installed firmware version must be at least V02.60.

3. Click "Next>".



All packages that you need to install are already selected.

4. Click "Install".
   The installation process itself is self-explanatory.
5. After the installation, click the "Exit" button.
6. For Analog Realtime Modulations (ATV) only:
   Execute *AtvVideoBasic_01.xx.xx.xx.msi* to install the new video signals (if available).

4 Open Source Acknowledgement

This instrument firmware makes use of valuable open source software packages. The most important of them are listed below together with their corresponding open source license. The verbatim license texts are provided in the following chapters.

Package	Link	License
OpenSSL	http://www.openssl.org	OpenSSL/SSLeavy
zlib	http://www.zlib.net	zlib, v.1.2.3
Xalan Xerces	http://xalan.apache.org/ http://xerces.apache.org/	Apache Software License, Version 2.0
ONC/RPC	http://www.plt.rwth-aachen.de	SUN
VNC	http://www.realvnc.com/	GPL V3

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 *    library being used are not cryptographic related :-).
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 */
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```
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version 1.2.3, July 18th, 2005
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*/
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